TR	ANSM	Docket No: PM 2000.010		
In Re A	pplicati	on Of: Hans Thomann, et al.		
	erial No 0/973,529	Filing Date	Examiner	Group Art Unit
Title:	Metho	d for Borehole Measurement of Formation Proj	perties	
, , , , , , , , , , , , , , , , , , ,		Address to: Assistant Commissione Washington, DC		
		37 CFR 1.97	(b)	
1.	filing forth	nformation Disclosure Statement submitted lof a national application; within three month in 37 CFR 1.491 in an international application on the merits, whichever event occurs last.	s of the date of entry of	of the national stage as set
		37 CFR 1.97	(c)	
2.	filing in an	nformation Disclosure Statement submitted of a national application, or the date of entry international application; or after the mail ever occurred last but before the mailing date	of the national stage as ing date of a first Of	s set forth in 37 CFR 1.491
		1. a Final Action under 37 CFR 1.113, o	or .	
		2. a Notice of Allowance under 37 CFR	1.311,	TEC
		Whichever occurs first.		TECHNOLOG PLC
	Also	submitted herewith is:		25 E
		a certification as specified in 37 CFR 1.97 (e);	
		OR		ン こ こ こ
		the fee set forth in 37 CFR 1.17 (p) for subtunder 37 CFR 1.97(c).	mission of an Information	

TRANSMITTAL OF INFORMATION DISCI (Under 37 CFR 1.97(b) or 1.	Docket No: PM 2000.010	
In Re Application Of: Hans Thomann, et al.	·	
Serial No. Filing Date 09/973,529 9 October 2001	Examiner	Group Art Unit
Title: Method for Borehole Measurement of Format	ion Properties	
Paym (Only complete if Applicant elects t	ent of Fee to pay the fee set forth in 37 C	FR 1.17(p))
A check in the amount of is attached.		
The Assistant Commissioner is hereby authorias described below. A duplicate copy of this s		posit Account No. 05-1328
Charge the amount of .		
Credit any overpayment.		
Charge any additional fee required.		
Stophen P./Coch Signature	January	, 21 200 Z Dated
Stephen P. Koch, Reg. No. 37,660		
ExonNobil - Upstream Research Company		
P. O. Box 2189 Houston, TX 77252-2189		
(713) 431-4811 Phone		
(713) 431-4664 Fax	Service as first	class mail under 37 C.F.R. 1.8 and is the Assistant Commissioner for Patents,
	Jan	new White
cc: LVA, JAJ		Maureen M. White

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Applicants
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	A28	5,835,883	11/10/98	Neff, et al.	702	7	
	A29	5,936,913	08/10/99	Gill, et al.	367	25	
	A30	6,176,323	01/23/01	Weirich, et al.	175	40	
	A31	6,206,108	3/27/01	MacDonald, et al.	175	24	
	A32	6,023,444	2/8/00	Naville	367	82	
	A33	6,262,941	7/17/01	Naville	367	82	
		OTHER D	OCUMENT	S (Including Author, Title, Date, Pertir	nent Pages, Etc.)	. , ,	
	B1			ure on Ultrasonic Velocity ical Prospecting, vol. 45, p			-Surface
Best, A.I., McCann, C., and Sothcott, J., "The Relationships Between the Velocities Attenuations and Petrophysical Properties of Reservoir Sedimentary Rocks", Geop Prospecting, vol. 42, pp. 151-178, 1994. Bowers, G.L., Pore Pressure Estimation from Velocity Data: Accounting for Over Mechanisms Besides Undercompaction, 1994 IADC/SPE Drilling Conference, Data SPE 27488, pp. 515-530, 1994.					•		
					•	-	
	B4 Cadoret, T., Mavko, G., and Zinszner, B., "Fluid Distribution Effect on Sonic Attenua Partially Saturated Limestones," Geophysics, vol. 63, no. 1, pp. 154-160, February 199						
	В5	Christensen, N.I., and Wang, H.F., "The Influence of Pore Pressure and Confining Pressu					
	В6	Dunn, K.J., "Acoustic Attenuation in Fluid-Saturated Porous Cylinders at Low Frequencies," J. Acoust. Soc. Am., vol. 79, no. 6, pp. 1709-1721, June 1986.					
	В7	Dunn, K.J., "Samp	le Boundary	Effect in Acoustic Attenual, vol. 81, no. 5, pp. 1259-	ation of Flui		Porous
	B8			R., and Nur, A., The Squirt 59, no. 3, pp. 428-438, Ma		nanism: Mac	roscopic
	B9	, ,		amic Poroelasticity: A Uns, vol. 58, no. 4, pp. 524-53		•	iirt and the
	B10			ur, A., "Squirt Flow in Full ary-February 1995.	y Saturated	Rocks," Geo	physics,
	B11	Esmersoy, C., et a Leading Edge, pp.		Imaging of Reservoir Struly 1998.	cture from a	Horizontal '	Well", The
	B12	.	•	, "P-wave attenuation Mea m Data", Geophysics, vol.			•
	B13	·	· · ·	"Fluid Pressure Response t Geophysics, vol., 51, no. 4		•	

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

DATE CONSIDERED

EXAMINER

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Docket Number (Optional)
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Applicants
Hans Thomann, et al.
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/ K		10/2/01			
30751	AMERICA	OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
	5.4	Han, De-hua, Nur, A., and Morgan, D., "Effects of Porosity and Clay Content on Wave			
	B14	Velocities in Sandstones", Geophysics, vol. 51, no. 11, pp. 2093-2107, November 1986.			
· · · · · ·	D16	Jones, T.D., "Pore Fluids and Frequency-Dependent Wave Propagation in Rocks",			
•	B15	Geophysics, vol. 51, no. 10, pp. 1939-1953, October 1986.			
_	D16	Jones, T.D., and Nur, A., "Velocity and Attenuation in Sandstone at Elevated Temperatures			
	B16	and Pressures", Geophysical Research Letters, vol. 10, no. 2, pp. 140-143, February 1983.			
	B17	Lucet, N., and Zinszner, B., "Effects of Heterogeneities and Anisotropy on Sonic and			
	B1/	Ultrasonic Attenuation in Rocks", Geophysics, vol. 47, no. 8, pp. 1018-2026, August 1992.			
,		Lucet, N., Rasolofosaon, P.N.J., and Zinszner, B., "Sonic Properties of Rocks Under			
Δ	B18	Confining Pressure Using the Resonant Bar Technique", J. Acoust. Soc. Am., vol 89, no. 3, •			
		pp. 980-990, March 1991.			
	B19	Mavko, G., and Jizba, D., "The Relation Between Seismic P- and S-wave Velocity			
	D19	Dispersion in Saturated Rocks", Geophysics, vol 59, no. 1, pp. 87-92, January 1994.			
	B20	Menke, W., and Dubendorff, B., "Discriminating Intrinsic and Apparent Attenuation in			
	B20	Layered Rock", Geophysical Research Letters, vol. 12, no. 10, pp. 721-724, October 1985.			
	B21	Morig, R., and Burkhardt, H., "Experimental Evidence for the Biot-Gardner Theory",			
	DZI	Geophysics, vol. 54, no. 4, pp. 524-527, April 1989.			
	B22	Murphy, F., III, "Effects of Partial Water Saturation on Attenuation in Massilon Sandstone			
	DEL	and Vycor Porous Glass", J. Acoust. Soc. Am., vol. 71, no. 6, pp. 1458-1468, June 1982.			
	B23	Tittman, B.R., et al. "Dissipation of Elastic Waves in Fluid Saturated Rocks", Physics and			
	1323	Chemistry of Porous Media, American Institute of Physics, pp. 131-143, 1984.			
		O'Connell, R. J., and Budiansky, B., "Viscoelastic Properties of Fluid-Saturated Cracked			
	B24	Solids", Journal of Geophysical Research, vol. 82, no. 36, pp. 5719-5735, December 10,			
· · · · · · · · · · · · · · · · · · ·		1977.			
		O'Hara, S.G., "Influence of Pressure, Temperature, and Pore Fluid on the Frequency-			
	B25				
		no. 1, pp.472-488, July 1985.			
	B26	O'Hara, S.G., "Elastic-Wave Attenuation in Fluid-Saturated Berea Sandstone", Geophysics,			
		vol. 54, no. 6, pp. 785-788, June 1989.			
·	B27	Palmer, L.D., and Traviolia, M.L., "Attenuation by Squirt Flow in Undersaturated Gas			
		Sands", Geophysics, vol. 45, no. 12, pp. 1780-1792, December 1980.			
	Dag	Parra, J.O., "The Transversely Isotropic Poroelastic Wave Equation Including the Biot and the Squirt Mechanisms: Theory and Application", Geophysics, vol. 62, no. 1, pp. 309-318,			
	B28	1 -			
		January-February 1997. Prasad, M., and Manghnani, M.H., "Effects of Pore and Differential Pressure on			
	חמם	Compressional Wave Velocity and Quality Factor in Berea and Michigan Sandstones",			
	B29	Geophysics, vol. 62, no. 4, pp. 1163-1176, July-August 1997.			
		Sams, M.S., Neep, J.P., Worthington, M.H., and King, M.S., "The Measurement of Velocity			
•	B30	Dispersion and Frequency-Dependent Intrinic Attenuation in Sedimentary Rocks",			
`•	1.030	Geophysics, vol. 62, no. 5, pp. 1456-1464, September-October 1997.			
,	-/-	DATE CONSIDERED			

DATE CONSIDERED

tion considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in d. Include copy of this form with next communication to applicant.

1/1/5		Docket Number (Optional)	Application Number
N_{Ω}	NFORMATION DISCLOSURE CITATION	PM 2000.010	09/973,529
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1116 7 3	El	Hans Thomann, et al. Filing Date	
No.	8/	10/9/01	Group Art Unit
STRANGE	OTHER DOCUMENTS (Including Author, Title, Date, Peri	tinent Pages, Etc.)	
	Spencer, J.W., Jr., "Bulk and Shear Attenuation in Berea	Sandstone: The Eff	ects of Pore
B3	Fluids", Journal of Geophysical Research, vol. 84, no. B	13. pp. 7521-7523 T	December 10
	1717.		₽
	Spencer, J.W., Jr., "Stress Relaxations at Low Frequenci	es in Fluid softward	D1
B3	Attenuation and Modulus Dispersion", Journal of Geoph	voicel Degeneter 1	ROCKS:
	1803-1812, March 10, 1981.	ysicai Research, voi.	86, no. B3, pp.
pa.	Kamata M et al "Deill 1:4		**************************************
B3	Symposium, June 15-18, 1997.	g optimization", SPV	VLA, 38 th
			•
B3-	Kamata, M., Underhill, W., Meechan, R., and Nutt, L., "] offer savings, improves safety" Petrol Fig. Vol. 70	Real-time seismic-w	hile-drilling
	offer savings, improves safety", Petrol. Eng. Vol. 70, no. McMillin K "Deenwater generates interesting."	10, pp. 37-39, Octob	per 1997.
B3:	McMillin, K, "Deepwater generates interesting seismic-w pp. 44, 104, March 1999.	hile-drilling technol	ogy", Offshore,
	Meehan R et al "Delandling internal"		
B36	Meehan, R., et al, "Rekindling interest in seismic while d January 1993.	rilling", Oilfield Rev	riew, pp. 4-13,
			P
B37	Meehan, R., Nutt, L., Dutta, N., and Menzies, J., "Seismichards choose chasing point".	c information helps p	redict drilling
	mazards, choose chasing point. Oil and tas fournal on	53-60 May 11 1000	-
B38	Nutt, L., "Drill bit seismic improves drilling data", The A	merican Oil & Gas F	Reporter, pp.
	<u> 37-02, November 1997.</u>		
B39	Poletto, F., et al, "Seismic while drilling using PDC signal	ls - SEISBIT experie	ence and
D39	Perspectives, EAGE 39 Conference and Technical Exhi	bition, Geneva, Swit	zerland, May
	== 50, 1557.	•	
B40	Ramaswamy, M., and Ioup, G.E., "Autocorrelation estima	tion using constraine	ed iterative
	pocular accomposition, Geophylsics, vol. 54, no. 3, np. 3	21-301 March 1000	
B41	Nector, J. W., III, "Drill string wave modes produced by a	working drill bit", 62	2 nd Ann Int
	Titig. obc., Expanded Abstracts, pp. 155-158, 1992		
B42	Rector, J.W., III and Hardage, B.A., "Radiation nattern and	d seismic waves gen	erated by a
	Toncreone unit of , Geophysics, vol. 5/, no. 10, np. 1319	1333 October 1002	_
B43	Rector, J. W., III, and Marion, B.P., "The use of drill-hit en	eray as a downhala	seismic
	1 source, deophysics, vol. 56, no. 5, pp. 628-634 May 199	1	_
	Rector, J.W., III, Marion, B.P. and Hardage P.A. "The w	20 of 1 1111	it for inverse
B44	ASEG Conference and Exhibition	vol. 20 nn 343-34	6 Sentember
	= 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1		
B45	Rector, J.W., Marion, B.P., and Widow, B., "Use of drill by	it energy as a downh	olo goiennia
	1 Journal of July III. Mile Of Self Expanded Abstracte	nn 161 164 1000	
	Tituliann, B.K., Nadler, H., Clark, V.A., and Ahlherg I. A.	"Frequency dense	lama = . C
B46	seismic dissipation in saturated rock", Journal of Geophysic	oal Pagagrah T -44	ence of
	pp. 36-38, January 1981.	oai Nescaren Letters,	voi. 8, no. 1,
	Todd, T., and Simmons, G., "Effect of pore pressure on the	volocite C	
B47	in low-porosity rocks", Journal of Geophysical Research, vo. 10, 1972	velocity of compres	sional waves
	10, 1972.	oi. //, no. 20, pp. 37	31-3743, July

MINER

DATE CONSIDERED

AMINER: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in ormance and not considered. Include copy of this form with next communication to applicant.

Docket Number (Optional) Application Number PM 2000.010 09/973,529 FORMATION DISCLOSURE CITATION Hans Thomann, et al. (Use several sheets if necessary) Group Art Unit Filing Date 10/9/01 OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.) Tutuncu, A.N., Podio, A.L., and Sharma, M.M., "Nonlinear viscoelastic behavior of sedimentary rocks, Part II: Hysteresis effects and influence of type of fluid on elastic **B48** moduli", Geophysics, vol. 63, no. 1, pp. 195-203, January-February 1998. Tutuncu, A.N., Podio, A.L., Gregory, A.R., and Sharma, M.M., "Nonlinear viscoelastic behavior of sedimentary rocks, Part I: Effect of frequency and strain amplitude", Geophysics, B49 vol. 63, no. 1, pp. 184-194, January-February 1998. Vo-thanh, D., "Effects of fluid viscosity on shear-wave attenuation in saturated sandstones", B50 Geophysics, vol. 55, no. 6, pp. 712-722, June 1990. White, J.E., "Biot-Gardener theory of extensional waves in porous rods", Geophysics, vol. 51, B51 no. 3, pp. 742-745, March 1986. Winkler, K.W., "Frequency dependent ultrasonic properties of high-porosity sandstones" B52 Journal of Geophysical Research, vol. 88, no. B11, pp. 9493-9499, November 10, 1983. Winkler, K.W., "Dispersion analysis of velocity and attenuation in Berea sandstones", Journal **B53** of Geophysical Research, vol. 90, #B8, pp. 6793-6800, July 10, 1985. Winkler, K.W., and Nur, A., "Seismic attenuation: effects of pore fluids and frictional **B54** sliding", Geophysics, vol. 47#1, pp. 1-15, January 1982. Aleotti, L., et al, 1994, "Impact of drill-bit seismic method on explorative wells", EAGE-56th B55 Meeting and Technical Exhibition., Vienna, Austria, June 6-10, 1994. Aleotti, L., et al, "SEISBIT-Latest applications of seismic while drilling technology", 57th **B56** EAGE Conference and Technical Exhibition, May 29-June 2, 1995. Aleotti, L., et al, "Seismic while-drilling technology: use and analysis of drill-bit seismic **B57** source in a cross-hole survey", Geophysical Prospecting, vol. 47, pp. 25-39, May-June, 1995. Bertelli, L., Savini, L., and Martera, M.D., 1997, "While Drilling Methodologies-the integration strategy and the impact of E&P activities", EAGE 59th Conference and Technical **B58** Exhibition, Geneva, Switzerland, May 26-30, 1997. Borland, W.H., et al, "Drill bit seismic, vertical seismic profiling, and seismic depth imagining to aid drilling decisions in the Tho Tinh structure-Nam Con Son basin-Vietnam". 95th Society of Exploration Geophysicists of Japan, Kyoto, October 23, 1996. Borland, W.H. and Drew, J, "Drilling Hazard Risk Reduction in Brunei Using Surface and Drill Bit Seismic Data", IADC Well Control Conference for the Asia Pacific Region, **B60** Singapore, December 4-5, 1997. Jackson, M., and Einchcomb, C., "Seismic While Drilling: Operational Experiences in B61 Vietnam", World Oil, pp. 50, 53, March 1997. Williams, D.M., et al, 1984, "The Long Spaced Acoustic Logging tool", SPWLA 25th Annual B62 Logging Symposium, June 10-13, 1994. Dickinson, George, "Geological Aspects of Abnormal Reservoir Pressures in Gulf Coast

EXAMINER	DATE CONSIDERED
EXAMINER: Initial if citation considered, whether or not citation is in co	nformance with MPEP Section 609; Draw line through citation if not in

Louisiana", Bulletin of the American Assoc. of Petroleum Geologists, Vol. 37, No. 2, pp.

Payne, Michael A., "Looking Ahead with Vertical Seismic Profiles", Geophysics, Vol. 59,

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

B63

B64

No. 8, pp. 1182-1191, August 1994.

410-432, February 1953.

SINFORMATION DISCLOSURE (TATION (Use several sheets if necessary)

Docket Number (Optional) PM 2000.010 Applicants Hans Thomann, et al.

W			Filing Date	Group Art Unit		
1			10/10/01			
EM. & TO		OTHER DOCUMENTS (Including Author, Title, Date, Per	rtinent Pages, Etc.)			
	Macpherson, J.D., Jogi, P., and Kingman, J.E., "Application and Analysis of Simu					
		Near Bit and Surface Dynamics", IADC/SPE 39397, pp.				
	Shuttleworth, N.E., van Kerkoerle, E.J., Folmer, D.R., and Foekema, N., "Revised D					
	B66	Practices, VSS-MWD Tool Successfully Addresses Cata	astrophic Bit/Drillstr	ing Vibrations",		
		IADC/SPE 39314, pp. 925-933, March 3-6, 1998.				
	B67	Meehan, R.J., Nutt, L., Dutta, N., and Menzies, J., "Dril		lling		
		Optimization Tool", IADC/SPE 39312, pp. 177-190, Ma		•		
		Heisig, G., Sanco, J., and Macpherson, J.D., "Downhole	_	•		
	B68	Data Provides New Level Drilling Process Control to Dr	riller", SPE 49206, p	p. 649-658,		
		September 27-30, 1998.	<u> </u>			
·	B69	Borland, W., et al., 1997, "Real-time Answers to Well I	Orilling and Design Q	uestions",		
	D 07	Oilfield Review, Summer 1997, pp. 2-15.				
	-	· Security of				

EXAMINER	DATE CONSIDERED
EXAMINER: Initial if citation considered, whether or not citation is in conformance and not considered. Include copy of this form with next communication.	•

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		OTHER D	OCUMENTS	(Including Author, Title, Date, Pe	rtinent Pages, Etc.)		
	:			head Predicition of Pornising Technologies", I			•
			Field Verificat	tion of Model Derived			Orill Sting",
		Kozawa, T., et al.,	"Active SWD	Using Monochromatic		he Third We	ll Logging
 - 		Mavko, G.M., et al	l., "Wave Atte	24-25, 1997, pp. 1-6.	turated Rocks'		al
		Rector, J.W., "Dril	Meeting, Hou I Bit Wavefiel	ston, Texas, October 2 lds", 54th Meeting and	7, 1976, pp. 10 Technical Exh	oibition, Pari	s France,
		June 1-5, 1992, pp	. 220-221.				
			-				
						-	
EXAMINER				DATE CONSIDERE	D		
EXAMINER:	Initial i	f citation considered, whet	her or not citation	is in conformance with MPEP	Section 609; Draw	line through cit	ation if not in

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